

CLAIMS

1 2 What is claimed is:

1 1. A VoIP telephone comprising:

2 a network communication system (16) for encapsulating data into IP frames (42)

3 for exchange with remote devices over a frame switched network (12);

4 a system client application (24) coupled to the network communication system

5 (16) for exchanging call set up messages (44) with a remote VoIP gateway (36) to

6 establish a media channel for the exchange of media session data;

7 a dialog system (32) coupled to the network communication system (16) for:

8 translating frames of compressed digital audio data originated from a

9 remote device to recreate remote voice band (54); and

10 detecting and translating local voice band (56) to compressed digital audio

11 data for transmission to the VoIP gateway (36);

12 detecting in-band signaling received from the VoIP gateway (36); and

13 providing session status signals (52), corresponding to the detected in

14 band signaling, to a presentation module (28);

15 the presentation module (28) receiving the session status signals (52) driving a

16 display of session status messages (50) on a display screen (30).

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1 2. The VoIP telephone of claim 1, wherein the system client (24) further provides

2 session status signals (52) to the presentation module (28) and the presentation module

3 (28) drives the display of session status messages (50) in accordance with both the

4 session status signals (52) from the dialog system and the system client (24).

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1 3. The VoIP telephone of claim 2, wherein:

2 the in-band signaling (62) is at least one of frequency signaling, cadence

3 signaling, and phase shift signaling within the remote voice band (54); and

4 the dialog system (32) detects frequency, cadence, and phase shift of the remote

5 voice band (54) and generates a session status signal (52) corresponding to the

6 detected in-band signaling (62).

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1 4. The VoIP telephone of claim 3, wherein:

2 the presentation module (28) comprises a message look up table (64) storing a
3 plurality of session status messages (50), each in association with a session status
4 signal (52); and

5 the presentation module (28) generates a session status message (50) on the
6 display (30) in response to receiving a session status signal (52) by looking up the
7 session status message (50) that corresponds to the session status signal (52) in the
8 message look up table (64).

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1 5. A VoIP telephone comprising:

2 a network communication system (16) for encapsulating data into IP frames (42)
3 for exchange with remote devices over a frame switched network;
4 a system client application (24) coupled to the network communication system
5 (16) for exchanging call set up messages (44) with a remote VoIP gateway (36) to
6 establish a media channel (46) for the exchange of media session data (48);

7 a compression module (26) coupled to the network communication system (16)
8 for:

9 receiving session media data (48) received over the frame switched
10 network (12) and recreating remote voice band (54) for driving a speaker;

11 receiving a local voice band (56) corresponding to audio detected by a
12 microphone (38) and generating media session data (48) for transmission over the
13 frame switched network; and

14 a display screen (30) for displaying a session status message (50) corresponding
15 to in-band signaling (62) within the remote voice band (54).

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1 6. The VoIP telephone of claim 5, further comprising:

2 an in-band signal detection module (60) for detecting the in-band signaling (62)
3 within the remote voice band (54) and generating a session status signal (52)
4 corresponding thereto; and

5 the presentation module (28) receives the session status signal (52) and
6 generates the session status message (50) in response to receiving the session status
7 signal.

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1 7. The VoIP telephone of claim 6, wherein:

2 the in-band signaling (62) is at least one of frequency signaling, cadence
3 signaling, and phase shift signaling; and

4 the in-band signal detection module (60) detects the frequency signaling,
5 cadence signaling, and phase shift signaling within the remote voice band and
6 generates a session status signal (52) corresponding to detected in-band signaling (62).

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1 8. The VoIP telephone of claim 7, wherein:

2 the presentation module (28) comprises a message look up table (64) storing a
3 plurality of session status messages (50), each in association with a session status
4 signal (52); and

5 the presentation module (28) generates a session status message (50) on the
6 display (30) in response to receiving a session status signal (52) by looking up the
7 session status message (50) that corresponds to the session status signal (52) in the
8 message look up table (64).

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1 9. The VoIP telephone of claim 6:

2 wherein the system client application (24) further generates a session status
3 signal (52) related to the media channel (46); and

4 the presentation module (28) receives both the session status signal (52)
5 generated by the system client application (24) and the session status signal (52)
6 generated by the in-band signal detection module (60) and generates a plurality of
7 session status messages (50), each in corresponding to a received session status
8 signal (52).

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1 10. The VoIP telephone of claim 9, wherein:

2 the in-band signal (62) is at least one of a dual tone multi-frequency signal within
3 the audio signal (54) and a polarity change of the audio signal (54); and
4 the in-band signal detection module (60) detects both the dual tone multi-
5 frequency signal and the polarity change within the audio signal (54) and generates a
6 session status signal (52) corresponding to the detected in-band signal (62).

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1 11. The VoIP telephone of claim 10, wherein:
2 the presentation module (28) comprises a message look up table (64) storing a
3 plurality of session status messages (50), each in association with a session status
4 signal (52); and
5 the presentation module (28) generates a session status message (50) on the
6 display (30) in response to receiving a session status signal (52) by looking up the
7 session status message (50) that corresponds to the session status signal (52) in the
8 message look up table (64).

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1 12. The VoIP telephone of claim 6, further comprising:
2 a key pad system (58) for modulating the local voice band (56) with a tone
3 corresponding to an operator depressed key to generate an in-band signaling (62)
4 within the local voice band (56); and
5 the in band signal detection module further detects in-band signaling within the
6 local voice band and generates a session status signal corresponding thereto;

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1 13. The VoIP telephone of claim 12, wherein:
2 the in-band signal (62) is at least one of a dual tone multi-frequency signal within
3 the audio signal (54) and a polarity change of the audio signal (54); and
4 the in-band signal detection module (60) detects both the dual tone multi-
5 frequency signal and the polarity change within the audio signal (54) and generates a
6 session status signal (52) corresponding to the detected in-band signal (62).

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1 14. The VoIP telephone of claim 13, wherein:

2 the presentation module (28) comprises a message look up table (64) storing a
3 plurality of session status messages (50), each in association with a session status
4 signal (52); and

5 the presentation module (28) generates a session status message (50) on the
6 display (30) in response to receiving a session status signal (52) by looking up the
7 session status message (50) that corresponds to the session status signal (52) in the
8 message look up table (64).

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1 15. A method of operating a VoIP telephone comprising:
2 exchanging call set up messages (44) with a remote VoIP gateway (36) to
3 establish a media channel (46) for the exchange of media session data (48);
4 receiving session media data (48) received over the media channel;
5 decompressing the session media data to recreate remote voice band (54) for
6 driving a speaker;
7 receiving a local voice band (56) corresponding to audio detected by a
8 microphone (38);

9 generating media session data (48) corresponding to the local voice band for
10 transmission over the media channel;

11 detecting the in-band signaling (62) within the remote voice band (54); and
12 displaying a session status message (50) corresponding to the detected in-band
13 signaling (62) on a display screen.

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1 16. The method of operating a VoIP telephone of claim 15, wherein:
2 the in-band signaling (62) is at least one of frequency signaling, cadence
3 signaling, and phase shift signaling; and the method further comprises:
4 detecting frequency signaling, cadence signaling, and phase shift signaling within
5 the remote voice band and generating a session status signal (52) corresponding to
6 detected in-band signaling (62).

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1 17. The method of operating a VoIP telephone of claim 16, wherein the step of

2 displaying a session status message (50) corresponding to the detected in-band
3 signaling (62) on a display screen comprises looking up the session status message
4 (50) that corresponds to the session status signal (52) in a message look up table (64).

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1 18. The method of operating a VoIP telephone of claim 15, further comprising:
2 generating a session status signal (52) related to VoIP signaling during
3 establishment of the media channel (46); and
4 displaying a session status message (50) corresponding to the generated
5 session status signal related to VoIP signaling.

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1 19. The method of operating a VoIP telephone of claim 18, wherein:
2 the in-band signaling (62) is at least one of frequency signaling, cadence
3 signaling, and phase shift signaling; and the method further comprises:
4 detecting frequency signaling, cadence signaling, and phase shift signaling within
5 the remote voice band and generating a session status signal (52) corresponding to
6 detected in-band signaling (62).

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1 20. The method of operating a VoIP telephone of claim 19, wherein the step of
2 displaying a session status message (50) corresponding to the detected in-band
3 signaling (62) and the generated session status signal related to VoIP signaling
4 comprises looking up the session status message (50) that corresponds to the session
5 status signal (52) in a message look up table (64).

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1 21. The method of operating a VoIP telephone of claim 15, further comprising:
2 modulating the local voice band (56) with a DTMF tone corresponding to an
3 operator depressed key to generate in-band signaling (62) within the local voice band
4 (56);
5 detecting in-band signaling within the local voice band and generates a session
6 status signal corresponding thereto; and
7 displaying a session status message (50) corresponding to the detected in-band

8 signaling (62) within the local voice band on a display screen.

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1 22. The method of operating a VoIP telephone of claim 21, wherein:

2 the in-band signaling (62) is at least one of frequency signaling, cadence

3 signaling, and phase shift signaling; and the method further comprises:

4 detecting frequency signaling, cadence signaling, and phase shift signaling within

5 the remote voice band and generating a session status signal (52) corresponding to

6 detected in-band signaling (62).

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1 23. The method of operating a VoIP telephone of claim 22, wherein the step of

2 displaying a session status message (50) corresponding to the detected in-band

3 signaling (62) and the generated session status signal related to VoIP signaling

4 comprises looking up the session status message (50) that corresponds to the session

5 status signal (52) in a message look up table (64).

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